VER 3

/12 Ch 18 Quiz Chem 122 Version 3 Name:_____

1. A)Write the equilibrium expression for the following. /2

$4NH_3(g) + 5\,O_2(g) \rightleftarrows 6H_2O(g) + 4\,NO(g)$

$$K_{eq} = \frac{[H_2O]^6[NO]^4}{[NH_3]^4[O_2]^5}$$

B) Calculate the value of Keq for the reaction A) above if analysis of the equilibrium mixture in a 1.00L flask at 650°C gives the following results /2

$[NH_3]$= 0.12mol
$[O_2]$= 0.40 mol
$[H_2O]$=0.30mol
$[NO]$=0.25mol

$$K_{eq} = \frac{0.3^6 \times 0.25^4}{0.12^4 \times 0.40^5}$$

$$= 1.34$$

2. Carbon disulfide can be made by the reaction of carbon dioxide and sulfur trioxide. /6

$2SO_3(g) + CO_2(g) + \text{heat} \rightleftarrows CS_2(g) + 4O_2(g)$

Assuming that the reaction is at equilibrium, what effect do the following changes have on the equilibrium position?

A) Addition of CO_2 RIGHT
B) Removal of heat LEFT
C) Decrease in the pressure RIGHT
D) Removal of O_2 RIGHT
E) Addition of a catalyst NO
F) Decrease in volume LEFT

R L R R Ø L

3. Give two adjustments that you would make to increase the amount of oxygen for the following equilibrium /2

$4NH_3(g) + 5\,O_2(g) \rightleftarrows 6H_2O(g) + 4\,NO(g)$

remove NH_3
add H_2O
add NO
decr V
Incr P

Any 2

VER 4

/12 Ch 18 Quiz Chem 122 Version 4 Name:_____

1. A)Write the equilibrium expression for the following. /2

$6H_2O(g) + 4\,NO(g) \rightleftarrows 4NH_3(g) + 5\,O_2(g)$

$$K_{eq} = \frac{[NH_3(g)]^4[O_2(g)]^5}{[H_2O(g)]^6[NO(g)]^4}$$

B) Calculate the value of Keq for the reaction A) above if analysis of the equilibrium mixture in a 1.00L flask at 650°C gives the following results /2

$[H_2O]$=0.30mol
$[NO]$=0.25mol
$[NH_3]$= 0.12mol
$[O_2]$= 0.40 mol

$$K_{eq} = \frac{0.12^4 \times 0.40^5}{0.30^6 \times 0.25^4}$$

$$= 0.75$$

2. Carbon disulfide can be made by the reaction of carbon dioxide and sulfur trioxide. /6

$2SO_3(g) + CO_2(g) + \text{heat} \rightleftarrows CS_2(g) + 4O_2(g)$

Assuming that the reaction is at equilibrium, what effect do the following changes have on the equilibrium position?

A) Removal of O_2 RIGHT
B) Addition of a catalyst NO
C) Decrease in volume LEFT
D) Addition of CO_2 RIGHT
E) Removal of heat LEFT
F) Decrease in the pressure RIGHT

R Ø L R L R

3. Give two adjustments that you would make to increase the amount of oxygen for the following equilibrium /2

$4NH_3(g) + 5\,O_2(g) \rightleftarrows 6H_2O(g) + 4\,NO(g)$

remove NH_3
add H_2O
add NO
Incr P
decr V

any 2